

NON-PUBLIC?: N
ACCESSION #: 8907310365

LICENSEE EVENT REPORT (LER)

FACILITY NAME: Clinton Power Station PAGE: 1 OF 4

DOCKET NUMBER: 05000461

TITLE: Water Intrusion Into Main Power Transformer Sudden Pressure Sensor Relay Causes Corrosion and Results in Relay Failure, Turbine Generator Trip and Reactor Scram

EVENT DATE: 06/28/89 LER #: 89-028-00 REPORT DATE: 07/27/89

OPERATING MODE: 1 POWER LEVEL: 100

THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR SECTION

50.73(a)(2)(iv)

LICENSEE CONTACT FOR THIS LER:

NAME: J. M. Emmert, Supervisor - Electrical Design and Analysis
extension 3404

TELEPHONE: 217 935-8881

COMPONENT FAILURE DESCRIPTION:

CAUSE: X SYSTEM: EL COMPONENT: RLY MANUFACTURER: Q011
REPORTABLE TO NPRDS: Y

SUPPLEMENTAL REPORT EXPECTED: NO

ABSTRACT:

On June 28, 1989, with the plant in Mode 1 (POWER OPERATION), the "C" Phase Main Power Transformer (MPT) sudden pressure sensor relay malfunctioned causing a trip of the main generator. The trip of the main generator resulted in a turbine trip and an automatic reactor scram because of the turbine control valve fast closure signal. The cause of this event is attributed to a spurious signal from the malfunctioning sudden pressure sensor relay. The sudden pressure sensor relay malfunctioned because of internal corrosion resulting from water intrusion into the relay. The sudden pressure sensor relay was replaced with a sensor relay which has an air vent to prevent moisture buildup inside the relay. The sudden pressure sensor relays were replaced in the other two main power transformers and also in the reserve auxiliary transformer and the emergency reserve auxiliary transformer.

END OF ABSTRACT

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DESCRIPTION OF EVENT

On June 28, 1989, at 0947 hours, with the plant in Mode 1 (POWER OPERATION), at 100 percent reactor (RCT) power, a turbine generator TG! trip occurred which resulted in an automatic reactor scram.

At 0947 hours on June 28, 1989, the "C" phase Main Power Transformer (MPT "C") XFMR! received a sudden pressure signal. The signal caused a trip of the main generator GEN!. The trip of the main generator resulted in a main turbine TRB! trip and an automatic reactor scram because of the turbine control valve V! fast closure signal. The turbine trip was followed by the completion of an automatic transfer of nonsafety busses BU! to the reserve auxiliary transformer as designed. The safety busses were being supplied by their normal source, the reserve auxiliary transformer, and did not transfer.

At 0947 hours, the Fire Protection deluge system automatically initiated in the MPT "C" area. The Fire Brigade was dispatched. The Fire Brigade reported the deluge system was spraying and that no flames could be seen. The automatic deluge system was secured at 1010 hours. The Fire Brigade was secured at 1130 hours.

No other automatic or manually initiated safety system responses were necessary to place the plant in a safe and stable condition. No other equipment or components were inoperable at the start of this event such that their inoperable condition contributed to this event.

CAUSE OF EVENT

The cause of this event is attributed to a spurious signal from a malfunctioning sudden pressure sensor relay RLY! on the MPT "C". The sudden pressure sensor relay malfunctioned because of internal corrosion resulting from water intrusion into the relay. Deterioration of the sudden pressure sensor relay caused the relay to operate erratically.

CORRECTIVE ACTION

IP evaluated the sudden pressure sensor relays used at Clinton and determined that the relays should be replaced with the current model of the same sudden pressure sensor relay which has an air vent to prevent moisture buildup inside the relay. Review of the vendor manual indicates that the sudden pressure sensor relay model previously used is no longer available and has been replaced with this current model, so reinstallation of the previously used

relay model would not be possible. Additionally, IP verified that the only replacement sudden pressure sensor relay available on Clinton site was the current model. The sudden pressure sensor relays for MPTs "A", "B" and "C", the reserve auxiliary

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transformer (normal source for safety busses) and the emergency reserve auxiliary transformer (backup source for safety buses), were replaced with the current model sensor. The sudden pressure sensor relays for the unit auxiliary transformers (normal source for nonsafety busses) were checked and tested with satisfactory results, but were not replaced because these relays have a different type of design that prevents moisture buildup in the relay.

Electrical tests were performed and an oil sample was obtained and analyzed for the MPT "C". The results of the electrical tests and the oil sample indicated an acceptable insulation value and acceptable dissolved gas contents. The results from the tests and sample indicate that the main power transformer is in satisfactory condition.

ANALYSIS OF EVENT

This event is reportable under the provisions of 10CFR50.73(a)(2)(iv) due to an automatic actuation of the Reactor Protection System JC!.

The MPT "C" became inoperable at 0947 hours on June 28, 1989. The sudden pressure sensor relay was replaced and tested, and the MPT "C" returned to an operable status. The main generator was synchronized to the grid at 1700 hours on June 30, 1989.

Assessment of the safety consequences and implications of this event indicates that this event was not safety significant. All equipment responses to the transient occurred as designed. Reactor water level was controlled without the use of Emergency Core Cooling Systems. Reactor pressure was controlled by the turbine bypass valves, and no main steam line safety relief valves RV! lifted.

This transient was compared to a similar transient, Generator Load Rejection with Bypass, described in Chapter 15 of the Updated Safety Analysis Report and the Transient Safety Analysis Design Report (GEZ-7355), and was found to be within the design basis of the plant.

ADDITIONAL INFORMATION

The transformer sudden pressure sensor relay that malfunctioned during this event is a General Electric Model 900-1 manufactured by Qualitrol. The

current model transformer sudden pressure sensor relay discussed in this LER is a General Electric Model 900-1A manufactured by Qualitrol.

LER 88-028-00 discussed a main transformer fault which resulted in a turbine generator trip and a reactor scram.

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For further information regarding this event, contact J. M. Emmert, Supervisor - Electrical Design and Analysis at (217) 935-8881, extension 3404.

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U-601490
L45-89(07-27)-LP
2C.220

ILLINOIS POWER COMPANY

CLINTON POWER STATION, P.O. BOX 678, CLINTON, ILLINOIS 61727

July 27, 1989

10CFR50.73

Docket No. 50-461

U.S. Nuclear Regulatory Commission
Document Control Desk
Washington, D.C. 20555

Subject: Clinton Power Station - Unit 1
Licensee Event Report No. 89-028-00

Dear Sir:

Please find enclosed Licensee Event Report No. 89-028-00: Water Intrusion Into Main Power Transformer Sudden Pressure Sensor Relay Causes Corrosion and Results in Relay Failure, Turbine Generator Trip and a Reactor Scram. This report is being submitted in accordance with the requirements of 10CFR50.73.

Sincerely yours,

D. L. Holtzsch

Acting Manager -
Licensing and Safety

LRH/krm

Enclosure

cc: NRC Resident Office
NRC Region III, Regional Administrator
INPO Records Center
Illinois Department of Nuclear Safety
NRC Clinton Licensing Project Manager

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